AMENDMENT TO THE CLAIMS

1. (Currently Amended) A method for removing impurities from waste water by electroflotation, the method comprising the steps of:

passing the waste water to be cleaned through an electrolytic cell (28) provided with two metal electrodes (1,2) of different electronegativities;

performing electrolysis between the two electrodes (1,2), such that the more electronegative electrode (1), which is non-wearing in a cleaning process, is used for producing hydrogen gas and hydroxyl ions from water, and that the less electronegative electrode (2), which is an active, wearing electrode in a cleaning process, is used for producing metal ions in a solution to be cleaned, ~~characterized in that~~ the method further ~~comprises~~ comprising ~~the~~ a combination of following steps:

automatically controlling the cell current ~~by automation~~to obtain a controlled electric field in the cell;

effecting in the cell in the controlled electric field a desired oxidation reduction reaction for removing one or more designated impurities from water to be cleaned;

feeding the mass flow from the cell to a separation tower (30) ~~of~~ that separates a flock and purified water and allowing the hydrogen gas to raise the flock in the separation tower (20);

using coaxial pipes as electrodes, the coaxial pipes defining an uninterrupted, generally cylindrical electrolysis space through which the hydrogen gas raises the flock in the separation tower along a generally linear path, the inner electrode pipe being the more electronegative electrode (1), having holes~~,~~; and

feeding flush water intermittently through the inner electrode pipe by pressure for producing flush water sprays through the holes against inner surface of the outer electrode pipe.

2. (Original) A method as set forth in claim 1 for removing nitrogen from waste water, characterized in that:

(a) in electrolysis, hydrogen ions (H.sup.+) are used for producing from ammonia (NH.sub.3) ammonium ions (NH.sub.4.sup.+), which escape upon joining negative ions and upon coprecipitating with iron hydroxide precipitate;

(b) the precipitate is allowed to rise along with hydrogen gas in the form of flock to the surface of clean water in the flock separation tower (30); and

(c) in electrolysis, iron is oxidized and NH.sub.4.sup.+ nitrogen and/or nitrate nitrogen (NO.sub.3) is reduced as follows:

$Fe+NH_4^+OH^- \Leftrightarrow FeO\downarrow+2\ H_2\uparrow+ 1/2N_2\uparrow$

and/or

$6Fe+2H^+ + 2NO_3 \Leftrightarrow 6FeO\downarrow+N_2\uparrow+H2\uparrow$

whereby the result is denitrification as nitrogen escapes from waste water in the form of nitrogen gas.

3. (Previously Presented) A method according to claim 1, where the waste water is landfill seepage or some other salt-containing waste water.

4. (Original) A method according to claim 3, characterized in that the seepage or other salt-containing waste water to be cleaned is conducted in a first stage through a first electrolytic cell, and in a second stage the water partially cleaned in the first stage of conducted through a second electrolytic cell.

5.(Previously Presented) A method as set forth in claim 1, characterized in that the less electronegative electrode is made of iron or aluminum.

6. (Currently Amended) An apparatus for removing impurities from waste water by electroflotation, said apparatus comprising a set of electrolytic cells, each cell thereof being provided with one or more metal electrodes (2) coupled with ~~the~~ a positive pole of a power source and one or more metal electrodes (1) coupled with ~~the~~ a negative pole of ~~a~~ the power source, and an electrolysis space (5) between the electrodes, the electrode (1) connected to the negative pole of a power source being made at least in its surface layer from a more electronegative material than the electrode (2) connected to the positive pole, the more electronegative electrode (1) being non-wearing in a cleaning process and releasing only electrons received thereby into a solution to be cleaned, and the less electronegative electrode being an active, wearing electrode in a cleaning process and releasing metal ions into a solution to be cleaned, the electrodes (1, 2) having such an electronegativity difference that a desired oxidation-reduction reaction is achieved~~,~~ ; ~~characterized by the combination of~~

~~automation for~~a control device controlling ~~the~~ a cell current, thereby enabling a desired oxidation-reduction reaction in the cell;

a separation tower (30) ~~of~~ separating a flock and purified water, ~~for~~ allowing ~~the~~ hydrogen gas to raise the flock in the separation tower (30);

a pump (27) for pumping a mass flow through the cell (28), as a closed continuous flow, to the separation tower (30);

coaxial pipes as the electrodes (1, 2), the inner electrode pipe being the more electronegative electrode (1) and having holes (4), the coaxial pipes defining an uninterrupted cylindrical electrolysis space through which the hydrogen gas raises the flock in the separation tower~~,~~ ; and

flushing means (16-20) for feeding flush water intermittently through only the inner electrode pipe by pressure for producing flush water sprays through the holes (4) against inner surface of the outer electrode pipe (2), the flushing means feeding

the flush water at a pressure higher than a pressure at which the pump (27) introduces the mass flow to the separation tower.

7. (Original) An apparatus as set forth in claim 6, characterized in that the less electronegative electrode is made of iron or aluminum, the iron or aluminum pipe (2) being the outermost and readily replaceable.

8. (Original) An apparatus as set forth in claim 7, characterized in that the outer electrode pipe (2) terminates prior to a waste water inlet (6), while the inner pipe (1) continues past the waste water inlet (6) by way of a valve (18) to a wash water pump (19).

9.(Original) An apparatus as set forth in claim 8, characterized in that the valve (18) has its opening and the wash water pump (19) has its actuation controlled to proceed intermittently, while a valve (17) in an outlet duct (16) connected to the bottom end of the electrolysis space (5) is adapted to be opened for discharging precipitate and wash water from the electrolysis space (5).

10. (Previously Presented) An apparatus as set forth in claim 7, characterized in that the inner electrode pipe (1) is made of stainless steel and the iron- or aluminum-made outer electrode pipe (2) is covered with an insulating housing tube (3).

11. (Previously Presented) An apparatus as set forth in claim 7, characterized in that the electrode pipes (1, 2) are locked concentrically to each other by means of unscrewable end caps (10, 15), which surround the ends of the inner electrode pipe (1) and inside which are retained the ends of the outer electrode pipe (2).

12. (Previously Presented) A method as set forth in claim 2, characterized in that the less electronegative electrode is made of iron or aluminum.

13. (Previously Presented) A method as set forth in claim 3, characterized in that the less electronegative electrode is made of iron or aluminum.

14. (Previously Presented) A method as set forth in claim 4, characterized in that the less electronegative electrode is made of iron or aluminum.

15. (Previously Presented) An apparatus as set forth in claim 8, characterized in that the inner electrode pipe (1) is made of stainless steel and the iron- or aluminum-made outer electrode pipe (2) is covered with an insulating housing tube (3).

16. (Previously Presented) An apparatus as set forth in claim 9, characterized in that the inner electrode pipe (1) is made of stainless steel and the iron- or aluminum-made outer electrode pipe (2) is covered with an insulating housing tube (3).

17. (Previously Presented) An apparatus as set forth in claim 8, characterized in that the electrode pipes (1, 2) are locked concentrically to each other by means of unscrewable end caps (10, 15), which surround the ends of the inner electrode pipe (1) and inside which are retained the ends of the outer electrode pipe (2).

18. (Previously Presented) An apparatus as set forth in claim 9, characterized in that the electrode pipes (1, 2) are locked concentrically to each other by means of unscrewable end caps (10, 15), which surround the ends of the inner electrode pipe (1) and inside which are retained the ends of the outer electrode pipe (2).

19. (Previously Presented) An apparatus as set forth in claim 10, characterized in that the electrode pipes (1, 2) are locked concentrically to each other by means of unscrewable end caps

(10, 15), which surround the ends of the inner electrode pipe (1) and inside which are retained the ends of the outer electrode pipe (2).

20. (Previously Presented) An apparatus as set forth in claim 15, characterized in that the electrode pipes (1, 2) are locked concentrically to each other by means of unscrewable end caps (10, 15), which surround the ends of the inner electrode pipe (1) and inside which are retained the ends of the outer electrode pipe (2).

21. (Previously Presented) A method according to claim 3, wherein the salt-containing waste water is contaminated sea water.

22. (New) A method for removing impurities from waste water by electroflotation, the method comprising the steps of:

passing the waste water to be cleaned through an electrolytic cell (28) provided with two metal electrodes (1,2) of different electronegativities;

performing electrolysis between the two electrodes (1,2), such that the more electronegative electrode (1), which is non-wearing in a cleaning process, is used for producing gas and ions from water, and that the less electronegative electrode (2), which is an active, wearing electrode in a cleaning process, is used for producing metal ions in a solution to be cleaned, the method further comprising a combination of following steps:

automatically controlling the cell current to obtain a controlled electric field in the cell;

effecting in the cell in the controlled electric field a desired oxidation reduction reaction for removing one or more designated impurities from water to be cleaned;

feeding the mass flow from the cell to a separation tower (30) that separates a flock and purified water and allowing the gas to assist in raising the flock in the separation tower (20); and

using coaxial pipes as the two electrodes, the coaxial pipes defining an uninterrupted, generally cylindrical electrolysis space through which the gas raises the flock in the separation tower along a generally linear path, the inner electrode pipe being the more electronegative electrode (1).

23. (New) The method of claim 22 wherein there are only two electrodes and wherein the less electronegative electrode comprises iron.

24. (New) The method f claim 22 wherein there are only two electrodes and wherein the less electronegative electrode comprises aluminum.